



National Science Foundation
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NSF 13-067

Dear Colleague Letter: Accelerating Integrative Research in Neuroscience and Cognitive Science (AIR-NCS)

Date: March 04, 2013

National Science Foundation
Directorate for Social, Behavioral & Economic Sciences
Directorate for Biological Sciences
Directorate for Computer & Information Science & Engineering
Directorate for Engineering
Directorate for Education and Human Resources
Directorate for Mathematical & Physical Sciences

The National Science Foundation seeks proposals with the potential to transform neuroscience and cognitive science. We invite proposals that accelerate new integrative research across disciplines and across spatial and temporal scales of analysis in cognitive science and neuroscience. Such approaches will enhance our understanding of how the brain regulates the individual's biology, processes complex social and physical cues, and allows organisms to behave in and adapt to changing environments.

Research aimed at understanding the brain is currently supported by virtually all of the disciplinary Directorates within the National Science Foundation (see Directorate web pages for details). For example, NSF currently funds research to better understand:

- the genetic, molecular, and cellular mechanisms responsible for brain evolution, development, function, and behavior (**Biological Sciences**);
- neural coding, signal processing, and computation; cognitive aspects of human-device interactions; brain-machine interfaces; computational neuroscience; representation and learning; and technology to support human learning (**Computer & Information Science & Engineering**);
- brain function, neural coding, cellular/genetic mechanisms underlying neuron cell behaviors, technologies for neuroregeneration and rehabilitation, neuroimaging/sensing, and the brain-computer interface (**Engineering**);
- STEM learning, in ways that may either inform or can be informed by neuroscience and STEM education, including brain structure/function relations, neural networks, computational neuroscience, functional imaging, neuroplasticity, and adaptive systems (**Education and Human Resources**);
- the biophysical dynamics and chemical underpinnings of neural processes, and mathematical, statistical, and computational modeling at all analytical scales of brain function (**Mathematical and Physical Sciences**); and
- cognitive science and the neuroscience of cognition and behavior (such as language, thought, decision making, and social processes), using behavioral, neuroscience, and computational methods (**Social, Behavioral, and Economic Sciences**).

While each Directorate currently engages primarily with independent research communities and may

fund different types of research approaches, this DCL specifically encourages the submission of proposals that emphasize integration across scales within one discipline, or across multiple research disciplines in neuroscience and cognitive science. This DCL also encourages projects that demonstrate innovation and creativity; leverage interdisciplinary approaches and knowledge; and advance the boundaries of science. Such proposals are welcome across four broad thematic areas:

- I. **Adaptation to changing environments**
- II. **Mechanisms underlying dynamic decisions and communication within and across scales**
- III. **Neural representations and coding**
- IV. **Technologies for discovering, analyzing and modeling brain function, neural coding, and circuits**

Proposals, including those focused on data issues, tools, and technology, may address one or more of the above thematic areas.

Possible Funding Mechanisms:

Principal Investigators are free to choose among the following mechanisms to support their integrative/interdisciplinary research, and research collaboration proposals in the thematic areas described above in response to this DCL. Proposals submitted by June 1 will be considered within the context of this DCL.

- Research Coordination Networks (RCN) awards are designed to build human capital platforms and provide the infrastructure for stimulating innovative communication. RCNs should focus on scientific areas that cross disciplinary boundaries, to promote dialogue and collaborations between researchers ([NSF 13-520](#)). Regardless of the specific scientific focus of the proposed collaboration, SBE RCN proposals should be submitted to one of the following programs in the Division of Behavioral and Cognitive Sciences: Perception, Action, and Cognition; or Cognitive Neuroscience. BIO RCN proposals can be submitted to various programs in the Neural Systems Cluster or the Behavioral Systems Cluster (within the Division of Integrative Organismal Systems).
- Early Concept Grants for Exploratory Research (EAGER) are used to support exploratory work in its early stages on untested, but potentially transformative, research ideas or approaches. This work may be considered especially high-risk, high-payoff (see GPG II.D.2). As with all EAGER proposals, PIs must contact the relevant program director first to discuss the appropriateness of their research ideas.
- An alternative funding opportunity, open equally to all NSF-supported areas of science including the topics of this DCL, is Integrated NSF Support Promoting Interdisciplinary Research and Education (INSPIRE, solicitation [NSF 13-518](#)). INSPIRE supports bold, interdisciplinary, potentially transformative research projects at a larger scale and duration than EAGER grants.

Refer to Directorate websites for specific programs and contact the managing Program Directors regarding the appropriate nature of your proposal for their program. The Proposal and Award Policies and Procedures Guide (PAPPG) http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf13001 provides specific submission details depending on the funding mechanism selected. Consult with the appropriate Program Director for further details.